

Livestock Seasonal Price Variation

Ernest E. Davis, James D. Sartwelle, III and James Mintert*

Nature dictates many of the production and supply patterns in the livestock industry. For example, a majority of the annual calf, lamb and kid crops are born in late winter and spring. By the time animals are weaned vegetation and forages are readily available. This also is the time when the animals' nutritional requirements are at a peak. Nature has a method of keeping this pattern fairly consistent unless interrupted intentionally by man. During the hot summer months, the fertility rates of both females and males decline as flesh condition declines with decreasing forage. For these reasons, supplies of feeder animals are usually largest during the fall and lowest during the spring. This production and supply pattern usually causes spring livestock prices to be higher than fall livestock prices.

Seasonal consumer demand patterns (such as a higher demand for beef in the spring) have caused livestock producers to alter production patterns to take advantage of market opportunities. Severe winter weather can disrupt marketings and cause prices to increase because of reduced weight gains. For these two reasons, fed cattle prices usually peak in March or April. Feedlots attempt to have supplies of fed cattle to meet this demand. Feeder cattle (700 to 800 pounds) are contracted or purchased in the late summer or fall to ensure that there are feeder cattle supplies to meet this market. At the same time, feedlot buyers must compete with stocker operations buying cattle to stock winter small grain pastures. During the 1970s and 1980s, this increased the demand for stocker-feeder cattle in the summer. Summer prices for these cattle are bid up from spring lows. Therefore, we now have two periods of the year when prices for 700- to 800-pound feeder cattle rise above the annual average prices—one peak in the winter and another in the summer.

Seasonal price movements can be measured over a period of years. Monthly prices can be indexed to show, proportionally, how much they are above or below the annual price average. With changing consumption patterns or transition periods of increasing or decreasing supplies, seasonal price patterns may change either permanently or temporarily.

The seasonal price indexes in this publication were calculated over a 10-year period (1989 through 1998) for Amarillo direct fed steers (1,100 to 1,300 pounds), Texas feeder steers (700 to 800 pounds), Texas feeder steers (500 to 600 pounds), San Angelo Cutter cows 1's and 2's, and San Angelo feeder lambs (55 to 90 pounds).

Two kinds of information have been extracted from this price data: 1) the monthly price variations relative to the annual average price or the monthly seasonal price indexes, and 2) the price variability within a month during the years included in the analysis. It is important when analyzing the variability of monthly average prices that the price data be "statistically normally distributed" before one can have confidence about the variability. For a data set to have a statistically normal distribution means that the frequency of the data, in this case monthly price data, centers around the average and is symmetrical on both sides (higher and lower than the average price), forming a mound shape (or bell curve) with the highest point being at the average. If the price data are statis-

Risk Management Education



*Professor and Extension Economist and Extension Program Specialist—Risk Management, The Texas A&M University System; and Extension Agricultural Economist, Kansas State University.

tically normally distributed, then the variability factor can be used with some degree of confidence (68 percent of the time) to develop price expectations. Specifically, the variation factor above and below the monthly price index specifies a range where price may be expected to fall 68 percent of the time.

Figures 1 through 6 plot the average annual price and monthly price index, with the variability range indicated by points above and below the index values. The monthly price index numbers and the monthly variability factors are listed at the bottom of each figure.

For example, in Figure 1 for January, the monthly price index of 102.58 means the average January price is 102.58 percent of the annual average price. The variability factor of 6.24 means that, statistically, the monthly index can vary 6.24 percentage points higher or lower than the monthly index. The price in a particular year may be as high as 108.82 percent ($102.58 + 6.24$) or as low as 96.34 percent ($102.58 - 6.24$) of the annual average. The smaller the variability factor (the closer the high and low points are to the monthly price index), the more reliable is the monthly price index.

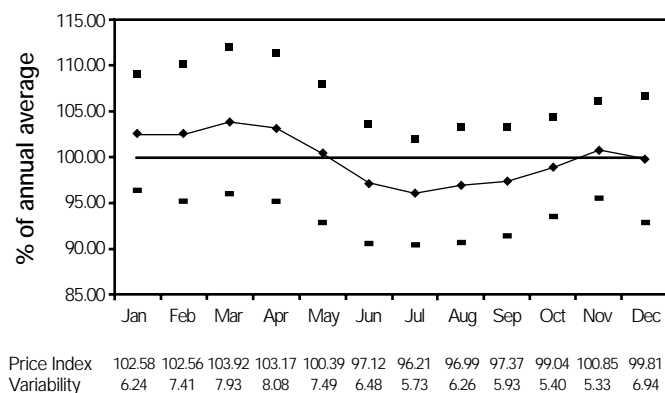
Monthly price indexes can be used as an indication of possible price trends for a period of time. The variability factor, **in cases where the price series is statistically normally distributed**, can be used to estimate the possibility of prices varying within the estimated range. Many of the livestock price indexes shown here have relatively large variability factors, which limits their value in projecting specific price trends. Also, only the price series for Amarillo direct fed steers and San Angelo feeder lambs, 55 to 90 pounds, are normally distributed. For the other price series, only seasonal price trends will be useful when planning marketings.

Seasonal price indexes also can be used to forecast prices for the months ahead based on the past relationship, again subject to normal distribution of the price data set. To forecast a future month, divide the current month's average price by the index of that current month, then multiply that number by the index of the future month for which the price forecast is being determined. For example, if June Amarillo direct fed cattle prices averaged \$64 per hundredweight (cwt.), the forecast for October would be \$64 divided by 97.12, multiplied by 99.04 = \$65.27 per cwt. Adjusting for the variability suggests that there is a 68 percent probability that the October monthly average price would fall between \$70.67 cwt. and \$59.87 cwt.

Seasonal Price Index for Amarillo Direct Fed Steers

The price series used for Amarillo direct fed steers was normally distributed, so this information can be used to predict price from current to future months and determine ranges of expected prices. The 10-year seasonal price pattern for fed steers in more normal years (i.e., no droughts or unusually large feedgrain price fluctuations) has been reasonably stable. As depicted in Figure 1, the highest prices for fed steers are expected to occur in March or April, and the lowest from June through September. This pattern is logical when you consider that the largest number of calves are usually weaned and marketed in the fall.

Figure 1. Seasonal price index, 1989-98, for Amarillo direct fed steers (1100 to 1300 pounds).



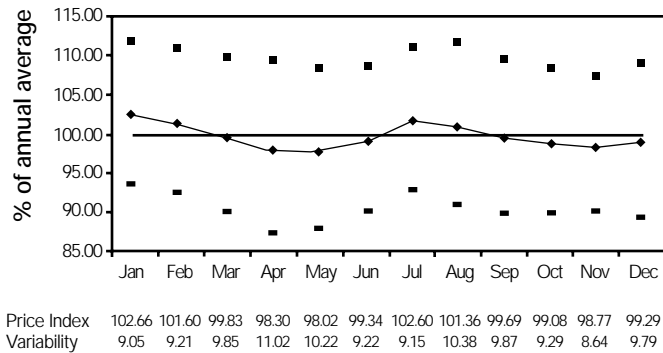
Seasonal Price Index for Texas Feeder Steers, 700 to 800 Pounds

The price series used for 700- to 800-pound Texas feeder steers was not normally distributed, so this information cannot be used to predict price from current to future months or to determine a range within which prices might be expected to fall. Note the high variability in the data. The variability ranges from a November low of \$8.64 per cwt. to an April high of \$11.02 per cwt. (Fig. 2). The seasonal price patterns are usually consistent across 10-year time periods, with highest prices in January, declining prices from then through May, increasing prices in June, July and August and declining prices in the fall.

This pattern seems logical when you consider that these cattle are in "storage" on improved winter pastures in January, begin moving to market in February, and are marketed in the largest numbers from March through May. In late spring and summer feedlots normally experience their largest marketings of the year and

their demand increases for replacement cattle to put on feed, to refill the feedyards. By fall most feedlots are full and feeder cattle prices decline. Usually there are also many calves from the year's calf crop on the market during the fall.

Figure 2. Seasonal price index, 1989-98, for Texas feeder steers (700 to 800 pounds).

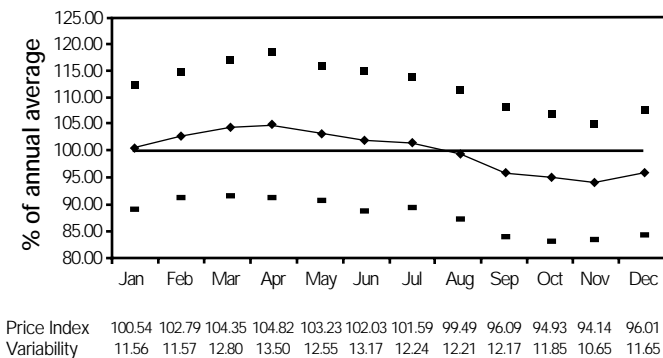


Seasonal Price Index for Texas Feeder Steers, 500 to 600 Pounds

The price series used for 500- to 600-pound Texas feeder steers was not normally distributed. Once again there was large variability in the data. The lowest monthly variability was November at \$10.65 per cwt. and the highest was April with a \$13.50 per cwt. price range (Fig. 3). The seasonality patterns, however, are generally consistent over 10 years, with the highest prices occurring in March, April and May and the lowest prices occurring September through December.

This pattern also seems logical because about 76 percent of the annual calf crop is born in the first 6 months of the year. There are short supplies of 500- to 600-pound calves during that period, but larger supplies after August when fall weaning and marketing begin.

Figure 3. Seasonal price index, 1989-98, for Texas feeder steers (500 to 600 pounds).

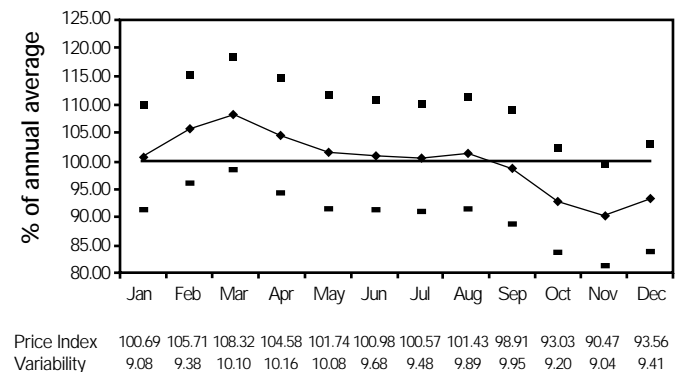


Seasonal Price Index for San Angelo Cutter Cows, 1-2

The price series used for the San Angelo Cutter Cows, 1-2, was not normally distributed. The monthly price variability was relatively high, but was about the same for each month. For example, November had the lowest monthly price variability of \$9.04 per cwt., and April had the highest at \$10.16 per cwt. (Fig. 4). The seasonalities of cutter cows are consistent with other studies on slaughter cows, with the higher prices February through April and the lower prices October through December.

Again, this seasonal pattern seems logical. Most calves are born from February through April. Ranges and pastures begin growing, with forage production heading towards seasonal peaks. Both conditions mean that not many cull cows will find their way to market. In the fall, however, with declining pasture conditions, fall weaning and marketing of calves, and pregnancy testing of cows, open cows are often sent to market.

Figure 4. Seasonal price index, 1989-98, for San Angelo cutter cows, 1-2.



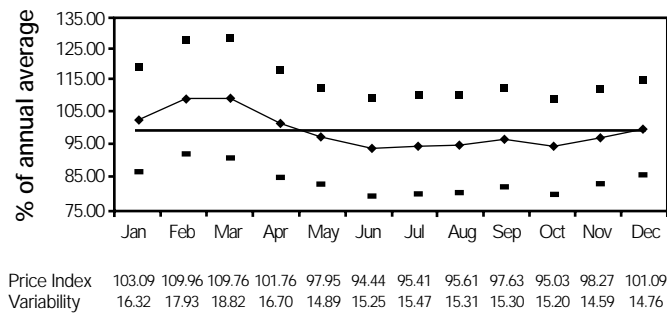
Seasonal Price Index for San Angelo Feeder Lambs

The price series used for San Angelo feeder lambs was normally distributed so this information can be used to predict price from current to future months and a price range into which prices might be expected to fall. The variability within the monthly price data, however, is so wide that the price projections would be of little help. For example, assume San Angelo feeder lamb prices averaged \$82 per cwt. during April. To get a price forecast for October, \$82 would be divided by 101.76 (April price index), then multiplied by 95.03 (October price index). The result is \$76.58 per cwt. Adjusting for the October variability suggests that there is a 68 percent

probability that the October San Angelo feeder lamb average price would fall between \$91.78 and \$61.38 per cwt. That wide range does not provide much help in planning market returns.

The data still show definite seasonal patterns of higher prices from January through April and lower prices for the remainder of the year. This is in line with spring lambing and Easter demand for lamb.

Figure 5. Seasonal price index, 1989-98, for San Angelo feeder lambs.



Partial funding support has been provided by the Texas Wheat Producers Board, Texas Corn Producers Board, and the Texas Farm Bureau.

Produced by AgriLife Communications and Marketing, The Texas A&M University System
Texas AgriLife Extension publications can be found on the Web at: <http://AgriLifebookstore.org>

Educational programs of the Texas AgriLife Extension Service are open to all people without regard to race, color, sex, disability, religion, age, or national origin.